REMARKS

Claims 1 – 20 are pending in the above-identified application, and Claims 9 – 20 are withdrawn from consideration due a prior election/restriction requirement.

In the Office Action, Claims 1 – 8 are rejected.

In this Amendment, Claims 1 and 3 are amended. No new matter has been introduced as a result of this amendment.

Accordingly, Claims 1 – 8 are at issue.

I. 35 U.S.C. § 102 Anticipation Rejection of Claims 1, 4, 5, 6, 7 and 8

Claims 1, 4, 5, 6, 7 and 8 were rejected under 35 U.S.C. § 102(b) as being anticipated by Tominaga (U.S. Patent No. 5,525,840). Although Applicant respectfully traverses this rejection, Claim 1 has been amended to clarify the invention and remove any ambiguities that may have been at the basis of these rejections.

Claim 1 is directed to a wafer. The wafer comprises alignment marks on an exposure surface, the alignment marks having edges for scattering inspection light for alignment during an exposure. The alignment mark is configured to have a plurality of dot pattern groups, each of the dot pattern groups being *projections from the exposure surface* and configured to have a plurality of dot patterns arrayed in a predetermined direction, and the plurality of dot pattern groups are arrayed in the predetermined direction with an interval between the dot pattern groups, the interval being wider than an interval between the dot patterns.

That is, the dot pattern groups are projections from the exposure surface.

This is clearly unlike Tominaga which teaches that the unit segments (dot patterns) 53 are in fact openings on the semiconductor substrate. In fact, Tominaga states in reference to FIGs. 10A – C, in column 2, lines 25 – 42, that (emphasis added):

> FIGS. 10A, 10B and 10C are plan views of alignment marks. In FIG. 10A, a plurality of unit markers 52 each of 4 .mu.m.times.4 μm in size are aligned in a single line so that the pitch P of the main diffraction grating 51 is 8 μm. Each of the unit markers 52 is composed of three unit segments 53 aligned in the column direction in which the unit markers are aligned. The length d.sub.1 of each unit segment 53 in the

scanning direction is 4 μm while the length 1 of each unit segment 53 in the column direction 0.8 μm. The space "s" formed between two adjacent unit segments 53 is 0.8 μm.

When the alignment mark of FIG. 10A is formed on a semiconductor substrate, each of the *submicron openings* has a rectangular area, unlike the first embodiment. However, the submicron openings 53 can be substantially completely filled with a metal layer because the width 1 of each submicron opening 53 is narrow, i.e., 0.8 μm. Accordingly, the alignment mark of FIG. 10A achieves advantages similar to those in the first embodiment."

As such, Tominaga fails to teach or suggest the dot pattern groups are projections from the exposure surface.

Thus, Claim 1 is patentable over Tominaga, as are dependent Claims 4, 5, 6, 7 and 8 for at least the same reasons.

Accordingly, Applicants respectfully request that these claim rejections be withdrawn.

II. 35 U.S.C. § 102 Anticipation Rejection of Claims 1, 4, 6, and 7

Claims 1, 4, 6, and 7 were rejected under 35 U.S.C. § 102(a) as being anticipated by Smith et al. ("Smith") (U.S. Patent No. 6,963,390). Applicant respectfully traverses this rejection.

As stated above, amended Claim 1 recites that the dot pattern groups are projections from the exposure surface.

This is clearly unlike Smith which uses filed points which comprise arrays of fiducials. These arrays of fiducials are represented by opening and spaces on an encoded face EF, as disclosed in column 7, lines 14 – 35 (emphasis added):

"FIG. 10A shows an example of a measurement fiducial with a clear opening in chrome 802 on the encoded face EF 224 of reticle 208 that has interspersed sub resolution (<λ/2*NA) chrome *openings 804 and spaces 806*. FIG. 10B illustrates examples of intensity profiles that can be produced by measurement fiducials such as shown in FIG. 10A. In FIG. 10B the vertical axis 820 represents light intensity at the sensing, or image, plane 242 and the horizontal axis 822 represents distance across the projected measurement fiducial. The intensity profile of a measurement fiducial that does not include a gradient would have a sharp-shouldered intensity profile indicated by the

dashed line 824. The intensity profile of a measurement fiducial that includes a gradient, such as illustrated in FIG. 8A, has what is called a rounded intensity profile 826. The rounding of the intensity profile reduces the light intensity near the edge of the fiducial and thereby helps reduce the effects of the diffraction. In either case, if the geometry and details of the measurement fiducials M1 are known, then the blurring, or effect, on the pupil intensity distribution S' will be known and will be calculable by standard methods known to those skilled in the art.

As such, Smith fails to teach or suggest the dot pattern groups are projections from the exposure surface.

Thus, Claim 1 is patentable over Smith, as are dependent Claims 4, 6, and 7 for at least the same reasons.

Accordingly, Applicants respectfully request that these claim rejections be withdrawn.

III. 35 U.S.C. § 102 Anticipation Rejection of Claim 2

Claim 2 was rejected under 35 U.S.C. § 102(b) as being anticipated by Tominaga (U.S. Patent No. 5,525,840). Applicant respectfully traverses this rejection.

Claim 2 is dependent on Claim 1, shown above to patentable over Tominaga. Thus, Claim 2 is also patentable over Tominaga for at least the same reasons.

Accordingly, Applicants respectfully request that these claim rejections be withdrawn.

IV. 35 U.S.C. § 103 Obviousness Rejection of Claim 3

Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Tominaga (U.S. Patent No. 5,525,840) and in further view of Yokota (U.S. Patent No. 6,801,313).

Claim 3 has been amended to recite that the dot pattern is a raised rectangular pattern. Moreover, as recited in Claim 1, the dot pattern groups are projections above the exposure surface.

This is unlike Yokota which teaches that the grooved pattern is formed by engraving a groove or an indent in a prescribed position on a layer where a circuit pattern is formed. As the Examiner acknowledged, this is supported in the Abstract and by Figure 5.

As such, Tominaga and Yokota may not be properly combined to reject Claim 1. Thus, Claim 1 is patentable over Tominaga in view of Yokota, as is Claim 3 for at least the same reasons.

Accordingly, Applicants respectfully request that these claim rejections be withdrawn.

V. Conclusion

In view of the above amendments and remarks, Applicant submits that Claims 1 – 8 are clearly allowable over the cited prior art, and respectfully requests early and favorable notification to that effect.

Respectfully submitted,

Dated: 3/9/07

By: _____

Christopher P. Rauch
Registration No. 45,034
SONNENSCHEIN NATH & ROSENTHAL LLP
P.O. Box 061080
Wacker Drive Station, Sears Tower
Chicago, Illinois 60606-1080
(312) 876-8000